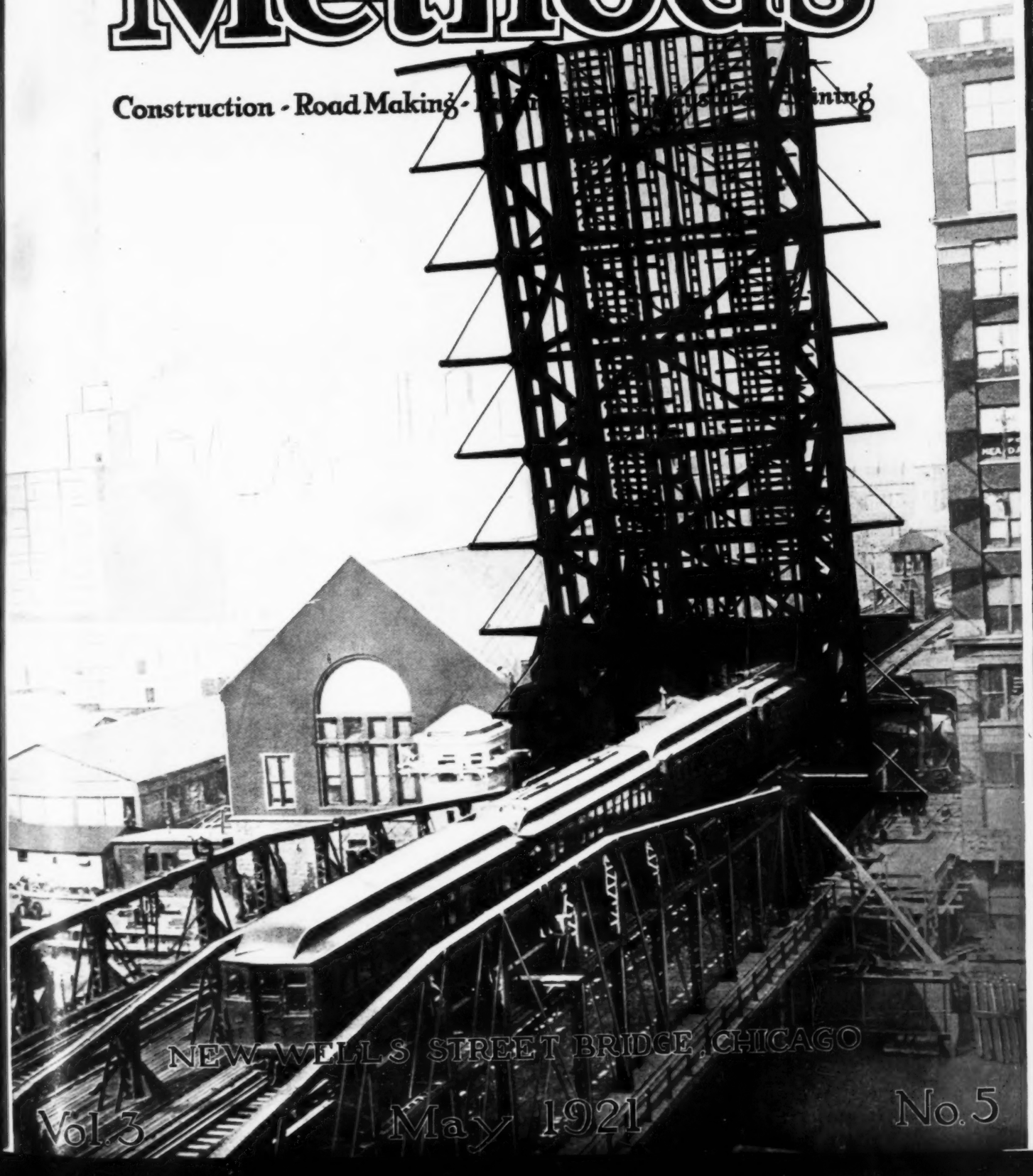
Successful Methods

Construction - Road Making - [illegible] - Mining



NEW WELLS STREET BRIDGE, CHICAGO

Vol. 3 May 1921 No. 5

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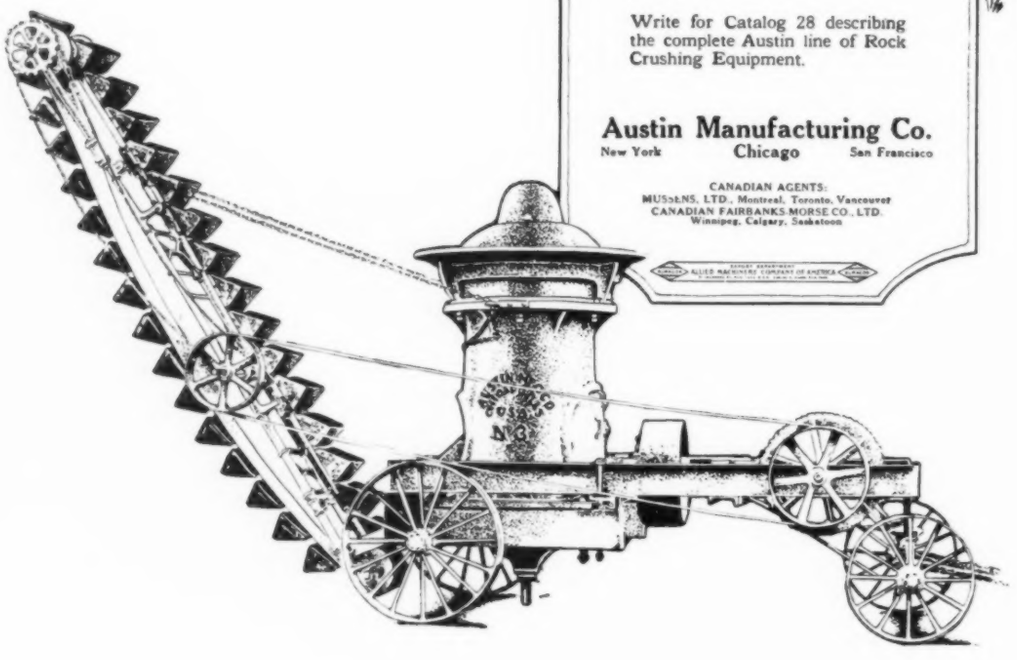

Successful Methods

A Magazine of Construction Service

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141 Centre St., New York City, N. Y.

Vol. III MAY, 1921 No. 5

Cheaper Labor and Better Tools

DURING the last few years of high labor wages wise construction managers have used the best tools and machines that could be bought. They have kept all their equipment in shape to operate properly. They have overlooked no opportunity to make the job easier for labor which knew it was unnecessary to do a real day's work.

Things have changed. Cheaper labor is in sight. Maybe you have not seen it, but it is real in many localities. What is better, men are working with something like reasonable efficiency.

This change in the labor situation probably will lead many engineers and contractors to give less thought to the selection and use of tools and equipment. But the need for greater man-hour output really is much more pressing under present conditions. For several years past bigger percentages of profit could be secured; funds were not hard to raise. Now there is stiff competition; it is hard to get money for any kind of work.

Lower wage rates and higher labor efficiency cannot alone be counted on to meet competition. They will be available to all. Nor will cheaper labor and a better day's work get the most done for the least money. Well-selected equipment, keen supervision and good management are more necessary on the construction job than they have been for years. Many of the older heads in the construction business recall what these factors meant in the nineties when common labor got $1.25 to $1.50 for ten hours' real work. Those who fail to recognize what was learned in those old days of keen competition, close margins and limited funds are likely in for trouble in the next year or two. Surely it is time to give serious thought to the kind of tools and equipment on your work.

The Old Ways Won't Do

THE present period of business depression and general lassitude in the construction field recalls a similar period, when conditions made the task of obtaining a contract not only difficult, but well nigh impossible. The Chicago Drainage Canal was started about that time, and many contractors sharpened their pencils, determined to bid on the work. Those contractors who actually landed contracts were up against the proposition of doing work with new methods and new plants if they were to break even or make money. As a result, more progress was made in the development of construction machinery and more ideas were put into actual practice than ever before.

Every method of mechanical earth handling was attempted, from cable ways to bucket loaders. The contractors were forced to cast about for new and more ingenious ways of doing work, and they succeeded.

At the present time the contractor is up against a similar condition of affairs. He cannot hope to compete in the coming construction program with antiquated methods and machines. In the last few luxurious years, any kind of machines would do, and almost any methods, but for tomorrow, the contractor must come alive. He must overlook no bet in getting for himself the last word in construction plant. He cannot afford to turn up his nose or decline without consideration any possible scheme for machines that might prove of merit.

To go on using old methods and old machines in 1921, without first determining that there is no possible chance of bettering them, will be suicide. He must compare old ways of doing work with new ways. It requires brains to tackle propositions now, and brains always recognize new ideas.

Keep on Your Toes

EVERY fresh set of construction statistics shows that there is more building going on than is generally supposed. The newspapers have done almost too thorough a job of telling the world that the construction industry is flat on its back. It isn't. It is alive and kicking, and you do not have to walk far in any city to find some big jobs under way.

Things are still far from normal, but conditions are improving every day.

So if you are in the construction game don't fold your hands because there is nothing doing. Get out and start something. Somebody will have to be the first in your neighborhood and it might just as well be you. Keep on your toes and don't let the big boom find you napping when it comes.

A Magazine of Construction Service

THE attention of our readers is called to the fact that the methods and devices which appear in SUCCESSFUL METHODS are described from actual use. They are methods actually giving satisfaction and are intended as practical hints and guides to contractors and others interested in modern construction methods.

Some of the Busy Spots

Above—Dormitories Built by Students of the University of Prague.

At the Left—Some Students Hard at Work.

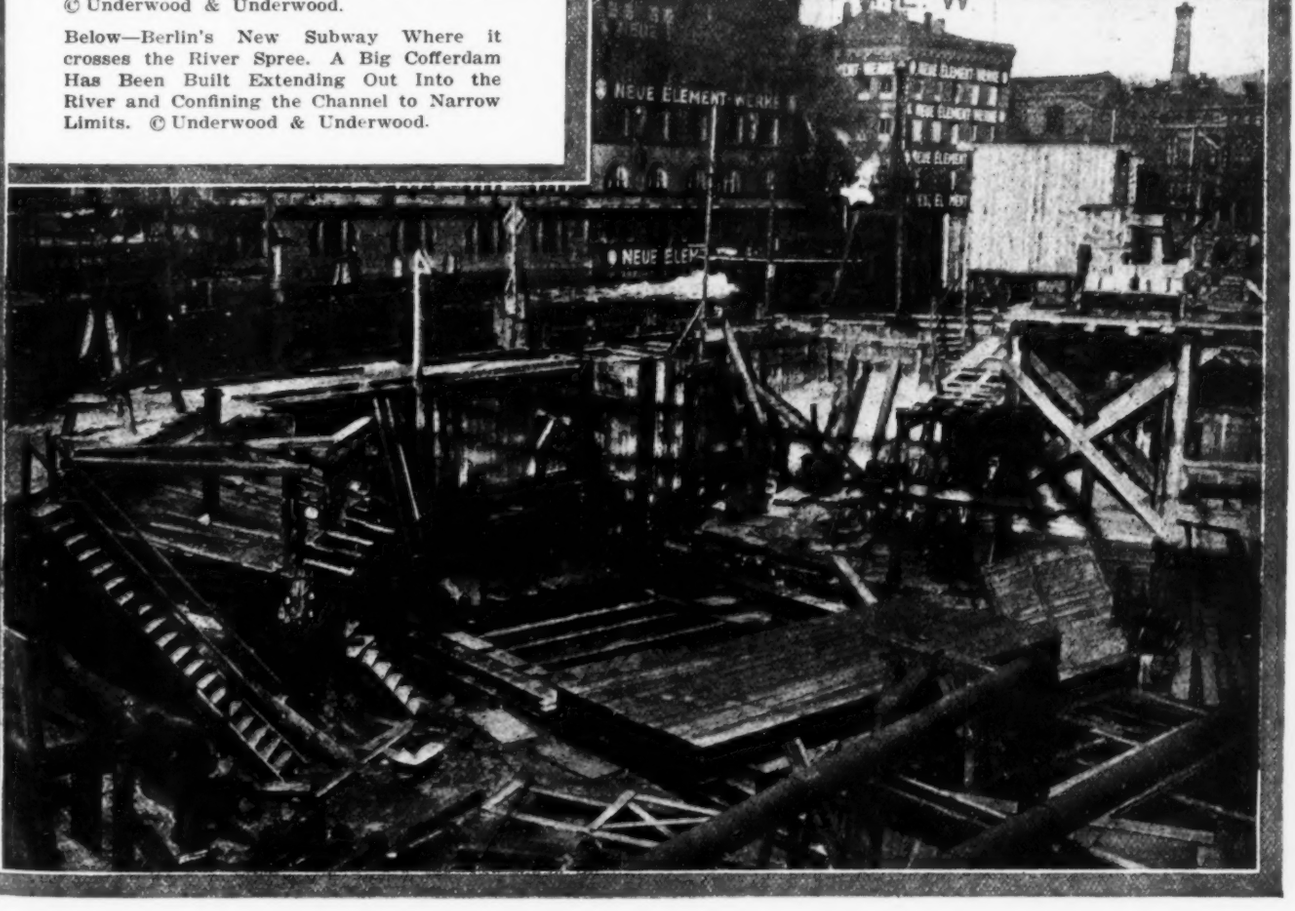
Below—One of England's New Arterial Roads which are being built for Heavy Trucking. At the Point Where This Photograph was Taken, a Fill of Chalk is Being Made. © Keystone Views.

In the Construction World

Above—Building Which Houses the Cuban End of the Havana-Key West Telephone Cable. Built With American Machinery.

At the Right—A Frame House Which Was Built Between Breakfast and Dinner. © Underwood & Underwood.

Below—Berlin's New Subway Where it crosses the River Spree. A Big Cofferdam Has Been Built Extending Out Into the River and Confining the Channel to Narrow Limits. © Underwood & Underwood.



BASCULE REPLACES SWING BRIDGE

New Double Deck Structure in Chicago Is Being Built with Minimum Interruption of Traffic

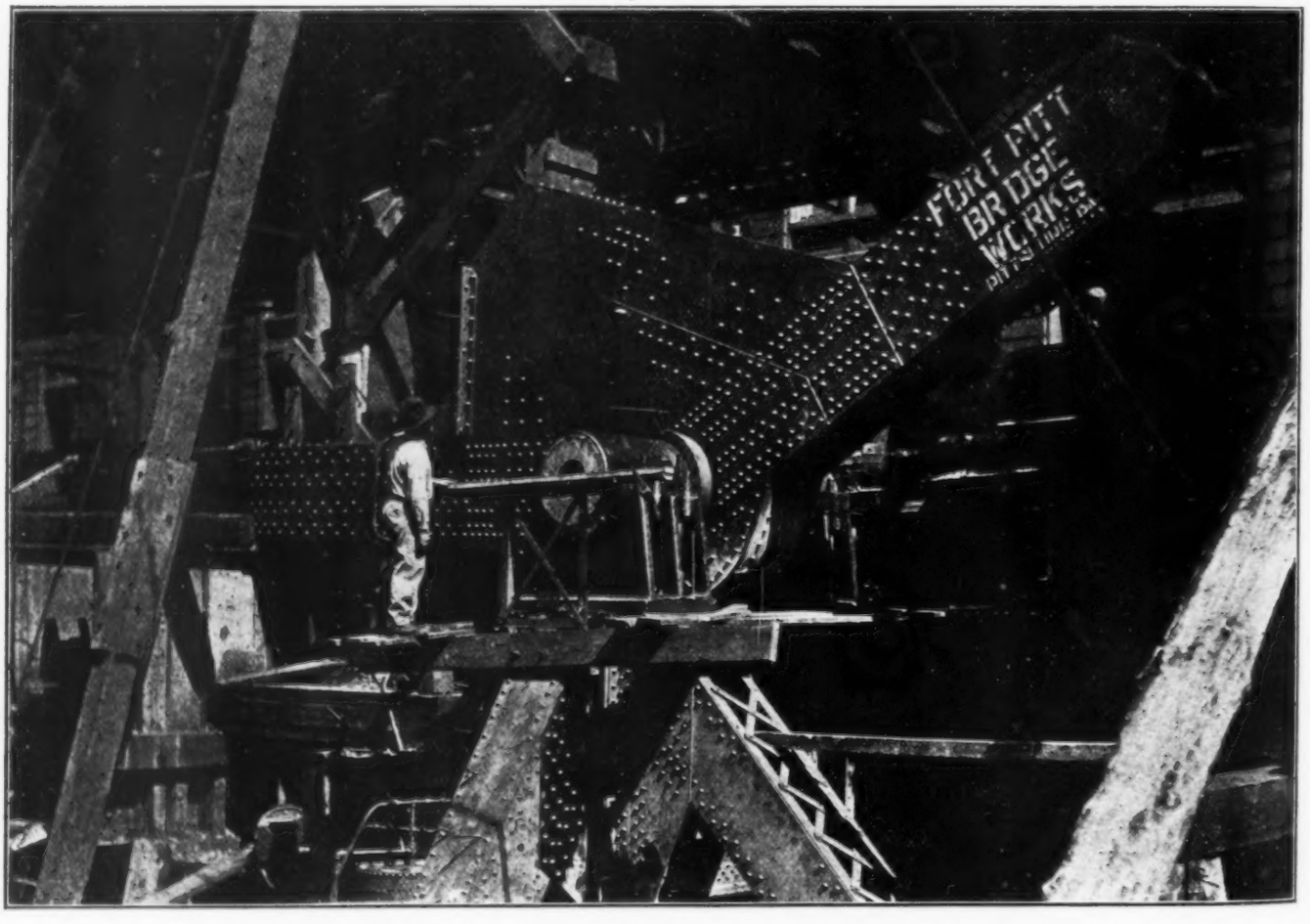
By Arthur W. Consoer

THE new Wells Street bridge across the Chicago River in Chicago is rapidly nearing completion, as shown on the cover of this issue of Successful Methods. The substructure has been completed and practically all of the structural steel has been erected. Work is progressing at a favorable rate on the ornamental concrete bridge towers, on the approaches and on the bridge floors.

The concrete bridge towers are pleasing architecturally and the bridge and towers have been designed to harmonize with the water front development along the Chicago River, between the new Franklin Street bridge, which is a good example of how much of the ugliness of a steel bridge can be eliminated by suitable architectural treatment, to the new Michigan Avenue "Boulevard Link" Bridge, which has received much favorable comment since it was opened to traffic last summer. All of these bridge improvements are part of the scheme for the improvement of the Chicago River proposed by the Chicago Plan Commission.

The Wells Street bridge is the most important avenue for traffic between the north side of Chicago and the loop district. It is a double-deck structure, the upper deck carrying the trains of the Northwestern Elevated Railroad and also the trains of the Chicago and North Shore Electric Railroad, and the lower deck carrying the street car traffic, vehicles, and pedestrians. It was deemed necessary by the city officials to erect the new bridge without seriously interrupting the traffic on either the upper or lower levels of the old swing span. The construction operations were planned so as to involve the least possible interruption to traffic. Naturally this procedure increased the cost of construction and has resulted in considerable delay in completing the bridge.

When the time comes to place the bridge in service it will be necessary to interrupt traffic for only a short time. It is estimated by the contractors for the superstructure that at that time traffic will be suspended for not more than 2 days. As shown in the construction views in this issue the spans of the new bridge are being erected in the upright position, so that the old swing bridge can remain in service at all times. When the erection of the new bridge has been completed, the swing bridge will be swung out and supported at the various panel points on pile bents. The center portion

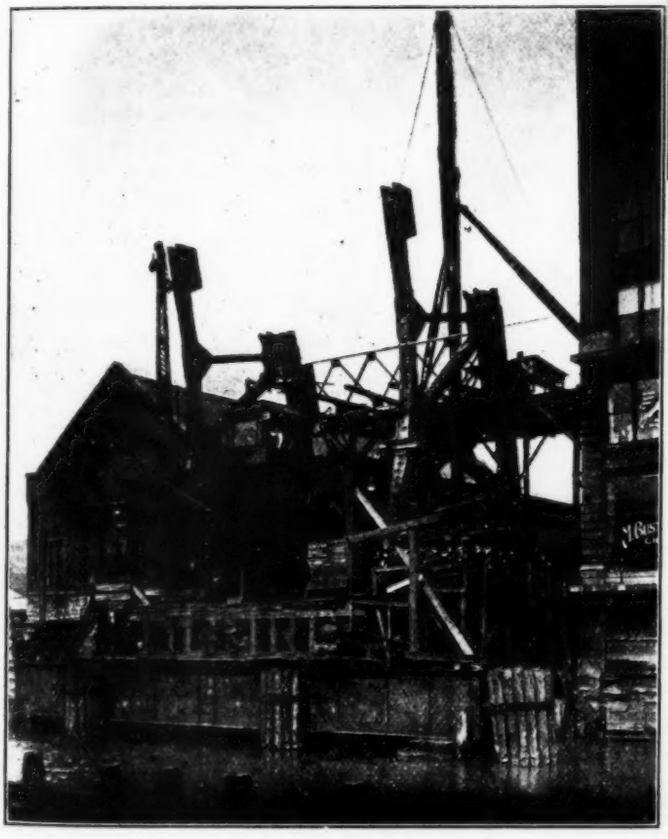


LINING UP ONE OF THE BIG TRUNNIONS. THIS OPERATION HAD TO BE CONDUCTED WITH GREAT CARE AND ACCURACY.

of the old bridge will be rapidly cut out with oxy-acetylene apparatus, and the two spans of the new bridge will be lowered into place.

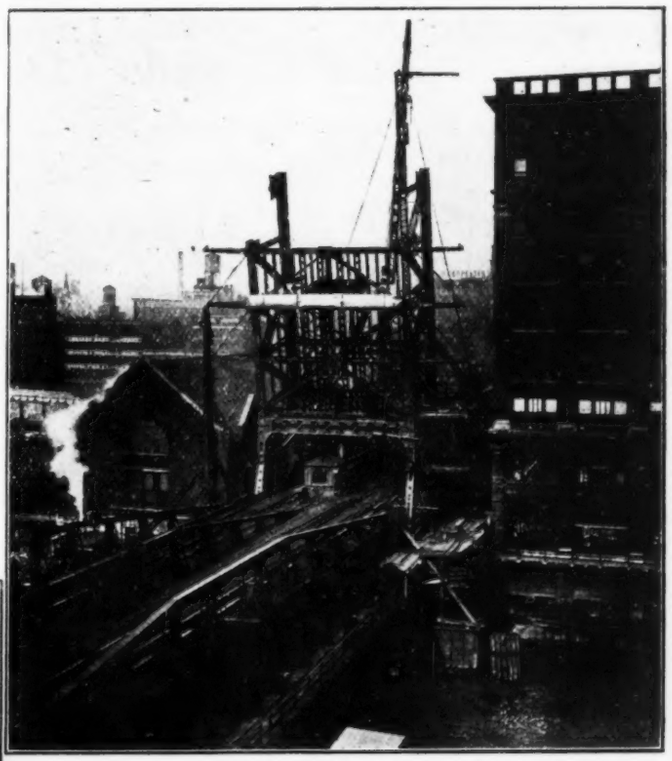
One other double-deck bridge of similar design has been built in Chicago over the river at Lake Street. In that case, however, no attempt was made to maintain traffic on the street level during the construction period, although provision was made for keeping the upper deck in service.

The new Wells Street bridge is of the trunnion bascule type as developed and designed by the Bridge Department of the City of Chicago. The new bridge has a span of 268 ft. between centers of trunnions, which will provide a clear channel of 200 ft. between the protection piers which will be built in front of each abutment. The upper deck carries two tracks of the elevated railroad and the lower deck has a 38-ft. roadway with two street car tracks, and also provides for two 13-ft. sidewalks.



THE NEW BRIDGE IN THE EARLY STAGES OF CONSTRUCTION.

One of the construction views shown in this issue illustrates the type of trunnion bearing used on this bridge. These trunnions are 27½ in. in diameter. Great care was used by the engineers in charge of the



STILL RISING WITHOUT INTERFERING WITH TRAFFIC.

work to insure the accurate placing of these trunnion bearings. The photograph illustrates the device which was used to line up the trunnions. Points were set on either side of each trunnion, and then a wire was stretched between these points and kept taut by hanging weights. The head of a pick which can be seen in the photograph is doing duty as a weight. The face of the trunnion was then brought to a correct position by measuring the correct offset from the wire, and adjusting the position of the trunnion base by means of jacks.

Timber platforms were placed as shown in one of the construction views to protect the traffic below from possible injury by falling rivets or tools.

In order to erect the spans in the upright position without interruption to traffic derricks for the erection were placed on top of the abutment walls and later other derricks were placed on top of platforms built over the elevated railroad. In this way the bridge members could be picked up from the barges in the river and hoisted into position without interruption to traffic on either deck of the old swing bridge.

The contractors for the substructure were the Fitzsimmons-Connell Dredge and Dock Company of Chicago, and the superstructure is being erected by the Ketler-Elliott Erection Company.

STATE AND BOROUGHS COOPERATE

ON a number of highways being constructed by the Pennsylvania State Highway Department the routes pass through boroughs in which the streets are wider than the highways outside of the borough limits. The problem presented by this condition has been solved by the state paying for 18 ft. of the total cost of the road within the boroughs and the borough paying for the extra width necessary to complete the paving from curb to curb. This method of adjustment is working out satisfactorily to both the state and the boroughs, and is a great improvement over the practice in some parts of the country where the cities and towns have absolute jurisdiction over the construction of roads within their limits.

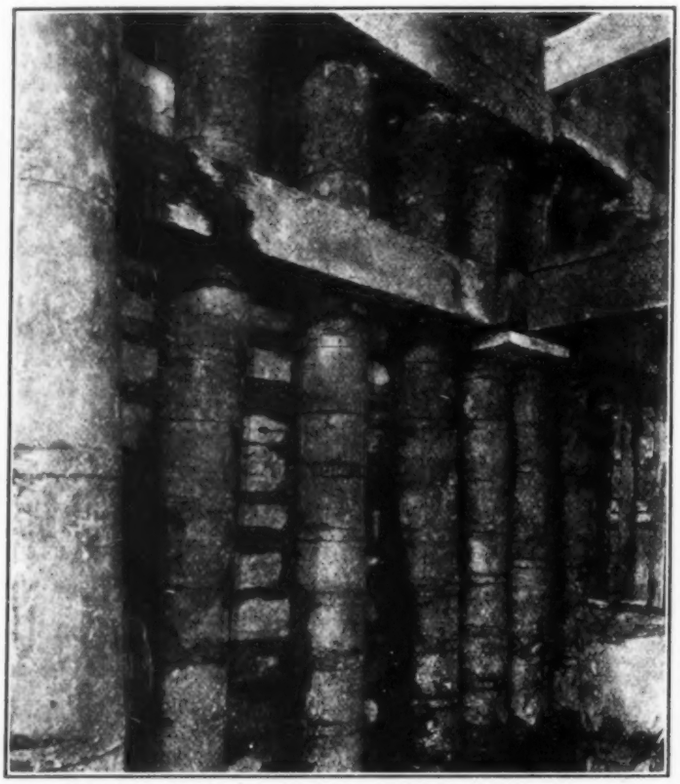
FOUNDATIONS AND SUPERSTRUCTURE ARE BUILT SIMULTANEOUSLY IN NEW YORK

Concrete Building, Eighteen Stories High, Proves Worth of New Method

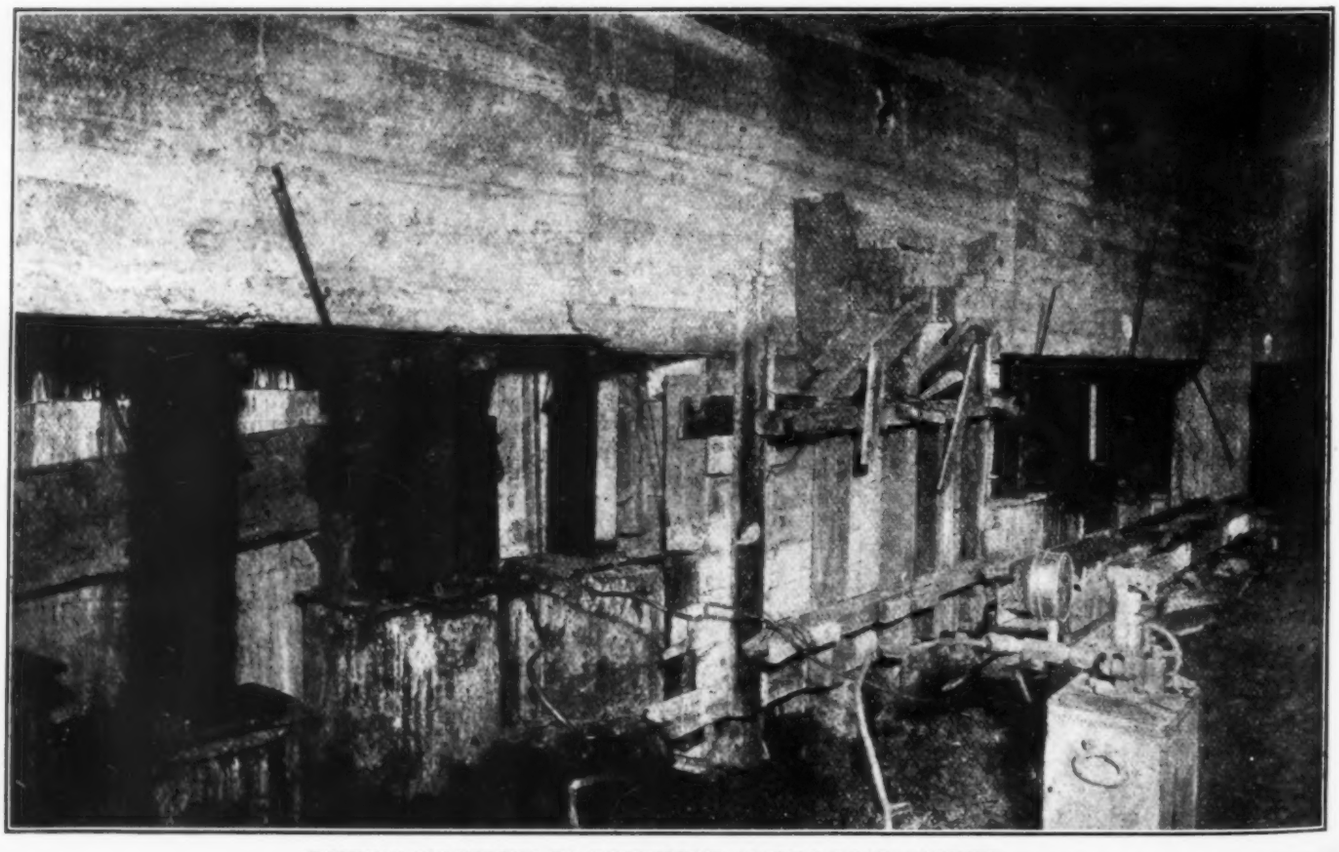
By CHAS. B. SPENCER, Vice-President, Spencer, White & Prentice

THE Hide and Leather Building, an eighteen story concrete structure at Gold and Frankfort Streets, in the center of the leather district of New York, known locally as the "Swamp," aside from being the highest reinforced concrete building in the United States, claims the distinction of being one of the first large buildings in which the foundations and superstructure were started and carried on at the same time. The method of constructing the foundation, which was really a process of underpinning the building as it was erected, is described herewith.

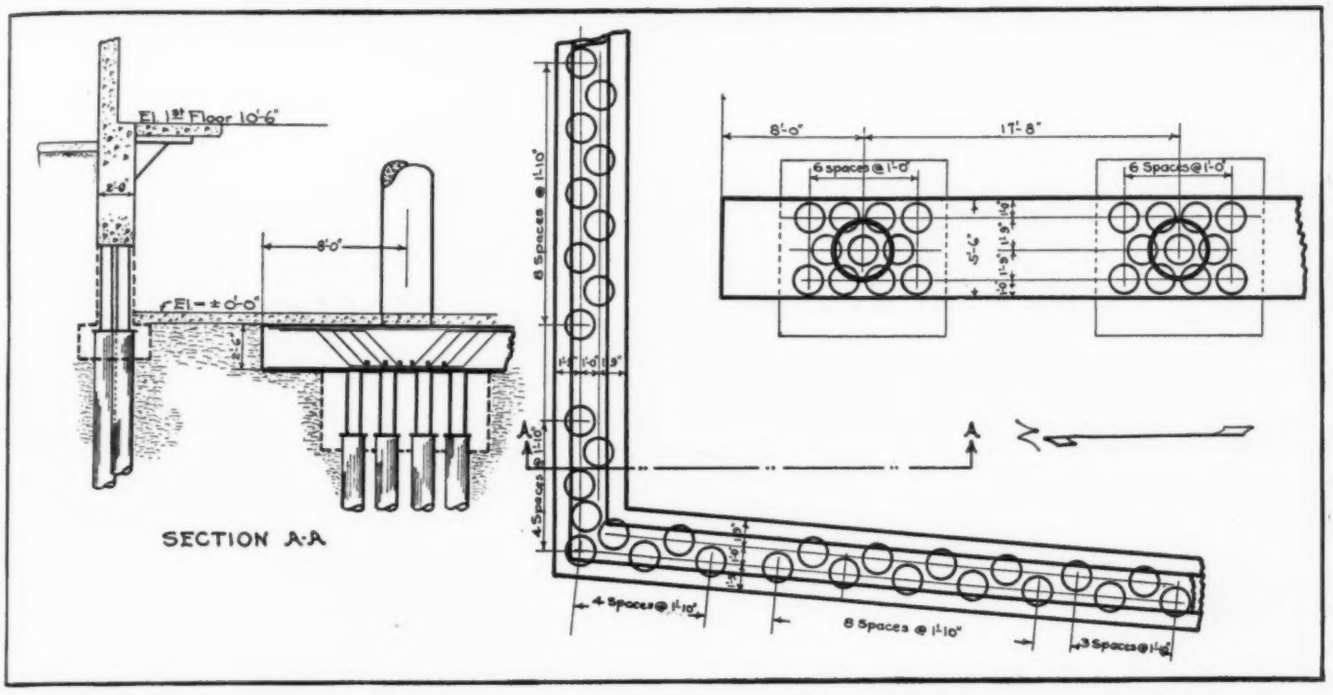
On account of the depth to rock being some 100 ft. below the pavement, rock-bearing foundations to that depth were prohibitive and concrete piling was considered. The chief factors involved were the heavy loadings, running up to 600 tons per column, and the fact that the building was unusually high as compared to the size of the plot, the ground area being 70 ft. by 80 ft., and the height of the building 225 ft. The design for concrete piles involved such large foundations that the incidental costs for excavation, sheathing, concrete, pumping and the underpinning of the building to the east were extremely large. It was felt, moreover, that there might be settlements in a structure so high in proportion to its width.



CYLINDERS EXPOSED TO SHOW HOW THEY DO THEIR WORK OF SUPPORTING A HIGH BUILDING.



TESTING CYLINDERS TO DETERMINE ACTUAL LOAD CARRIED.



PARTIAL PLAN SHOWING LOCATION OF PRETEST CYLINDERS UNDER HIDE & LEATHER BUILDING

The system adopted avoids these difficulties. Steel shells first are sunk and later filled with concrete. Then they are forced to refusal by hydraulic jacks and the load is transferred to the pile in such a way that settlement due to rebound is impossible.

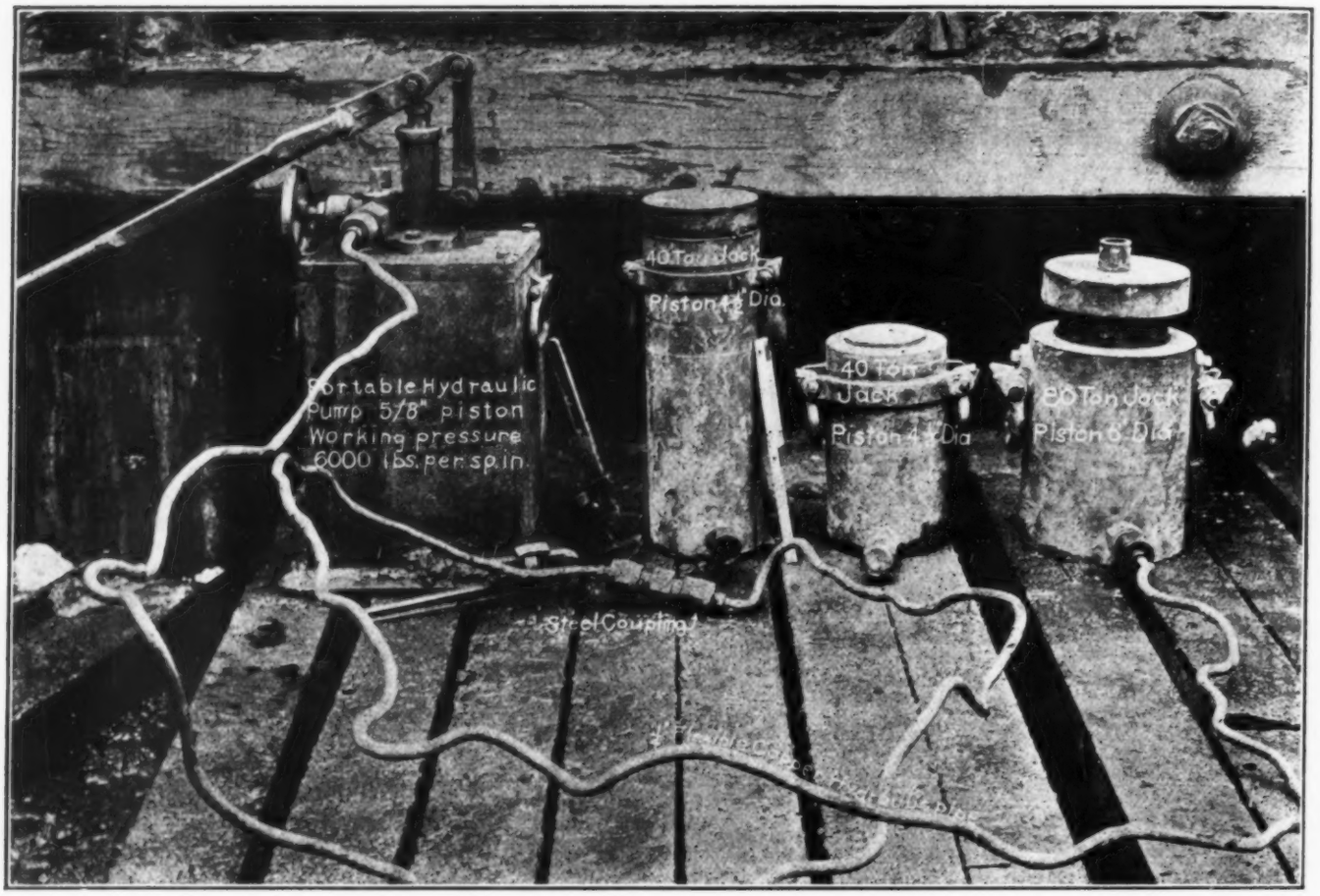
The preliminary work of installing the empty shells which make up the cylinders was begun the first week in September, 1920. The steel shells, located as shown on the partial plan above, are 20 in. in diameter and 36 in. long, and were driven partly by hand hammers and partly by light steam hammers to the top of the sand stratum, a depth of approximately 20 ft. below the street. To facilitate the sinking, the excavation within the shells was carried on simultaneously with the driving. Special augers developed by the contractor for excavating within the underpinning cylinders were used for this work. After the shells were excavated in this manner, they were filled with concrete.

For the interior columns, the cylinders were located in pits as shown in the plan. The depth of the pits was sufficient to allow 4 ft. of working height beneath the girders, which were 2 ft. 6 in. deep. The shells were filled with concrete as soon as they reached the sand stratum. From the tops of the concreted cylinders wooden blocking was carried to the bottom of the wall girder in the case of the exterior columns and to the continuous footings in the case of interior columns. The forms were constructed resting on this blocking and the girder footings then poured. It was computed that the bearing value of the cylinders afforded a preliminary footing for at least 70 tons per column.

Erection of the superstructure was begun October 1, 1920, and within a week sufficient reaction had been provided to permit the forcing of all the cylinders to a test load of 40 tons each. The manner in which the cylinders were sunk is shown in one of the photographs. Two hydraulic jacks are shown in place, using the exterior wall girder as a reaction to sink the shells to refusal or the desired test load. The gage may be seen, which indicates the pressure on the jacks. In another picture is shown the hydraulic ram which operates the jacks.

With the pouring of the fourth floor above the street it was estimated that an average load of 75 tons was carried on each column. One cylinder of each group was then forced hydraulically to its final test load. The cylinders were designed on a unit load of 50 tons and an overload test of 50 per cent was made on each. The average penetration required for this test was about 3 ft. below the sand stratum before mentioned. The testing was done with 2 4½-in. hydraulic rams operated from a hand pump. These rams, which are shown in one of the illustrations, were sufficiently separated to permit the insertion between them of a 12-in. I-beam. As soon as the cylinder came to refusal under a pressure of 4700 lb. per sq. in., a beam was cut to the exact length to fit between the top of the cylinder and the bottom of the footing, allowing about one-half inch for the wedges. This beam was wedged in place before the load on the rams was released. This process was repeated with the second cylinder of each group and continued until all the cylinders had been tested against the girders and footings. The last cylinders were not completed until the roof had been poured, being tested on March 12, 1921. The space between the wedging beam was then filled with concrete. The concrete serves in the case of the wall cylinders as the lower 4 ft. of the cellar wall.

By this method, in addition to the advantage of being able to carry on the erection of the superstructure simultaneously with the foundation work, a definite test is made on each cylinder, and its carrying capacity definitely determined. The cylinders are wedged against the foundation while the full test load is maintained. The importance of eliminating the rebound of a cylinder was demonstrated in the underpinning of the



HYDRAULIC RAMS USED TO SINK CYLINDERS

buildings along the William Street Subway. After the first few buildings had been underpinned by means of cylinders wedged in the ordinary way, it was found that upon a release of the jacking load, the cylinders would rebound about one-half inch and that a reapplication of the same load would cause a settlement of 2 in. or more. The method described was devised to eliminate this settlement.

Thompson & Binger were the architects, engineers, and general contractors; Starrett & Van Vleck were consulting architects. Preliminary work was started in the first week in September, 1920, and concreting of the pent house and roof was recently completed. The building proper is of the flat slab type to the fourteenth floor, above which beam and girders are used to give greater stiffness. Pouring the concrete on the superstructure proper progressed at the rate of a floor a week.

MECHANICAL ENGINEERS TO DISCUSS ROAD PROBLEMS

THE cause of highway building will be advanced at the annual meeting of the American Association of Mechanical Engineers, which is to be held this year, May 23 to 26, at the Congress Hotel in Chicago. The new Material Handling Division of the society will devote its time to a discussion of "Design and Construction of Machinery for Road Building." Four papers will consider this problem from the various viewpoints of the contractor, the road builder and the engineer. Instead of excursions to construction jobs, moving pictures will be shown in which road-building machinery of all kinds will be displayed.

The papers on the program are as follows: "Planning and Organization of a Road Job for the Mechanical Handling of Material," by C. D. Curtis; "Road Plant Operations, with Practical Analysis of Operating Road Plants," by B. H. Piepmeier, and "What the Contractor Needs," by General R. C. Marshall, Jr.

The activities of the Material Handling Division have been divided as follows:

"Material handling in this division is concerned only with what may be called the problems of secondary transportation of materials and commodities. It does not concern itself with the broad transportation problems of the common carriers, or the tributaries to common carriers, such as organized highway trucking systems, interurban freight lines, and so on.

"Material handling has to do with the multitudinous operations of 'picking up and putting down' materials in process of production, and the handling problems of the linkages between common carriers and delivery to the user."

SUBGRADE TESTS IN ILLINOIS

Cylinders Set in Concrete Slab During Construction Furnish Valuable Data

By H. F. CLEMMER
Testing Engineer, Illinois Highway Division

REALIZING that the character and condition of the subgrade are important factors in the life of paved roads, the Illinois Highway Division has been conducting a series of tests on what is known as the Bates Experimental Road. This road consists of 63 sections of various types of surfacing and it was recognized that the condition of the subgrade as well as of the surfacing should be studied thoroughly. For the purpose of making the necessary tests, the instruments described in this article were devised, installed in the Bates Road, and are furnishing data of great value.

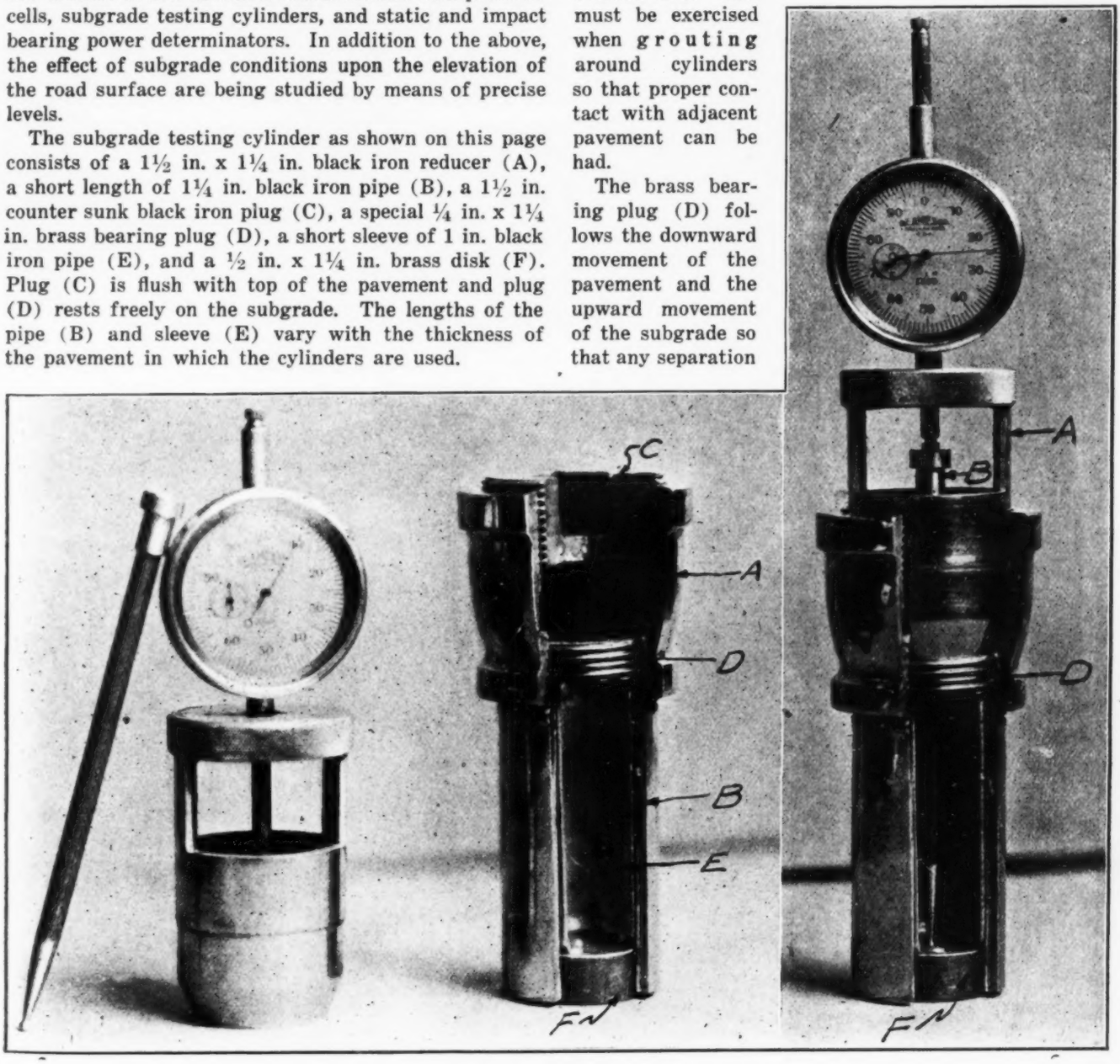
This investigation includes determination of moisture content of soil as well as observations with pressure cells, subgrade testing cylinders, and static and impact bearing power determinators. In addition to the above, the effect of subgrade conditions upon the elevation of the road surface are being studied by means of precise levels.

The subgrade testing cylinder as shown on this page consists of a 1½ in. x 1¼ in. black iron reducer (A), a short length of 1¼ in. black iron pipe (B), a 1½ in. counter sunk black iron plug (C), a special ¼ in. x 1¼ in. brass bearing plug (D), a short sleeve of 1 in. black iron pipe (E), and a ½ in. x 1¼ in. brass disk (F). Plug (C) is flush with top of the pavement and plug (D) rests freely on the subgrade. The lengths of the pipe (B) and sleeve (E) vary with the thickness of the pavement in which the cylinders are used.

When it is desired to install testing cylinders in a concrete pavement at the time of the construction of the pavement, wooden cylinders 3 in. in diameter and about ½ in. less in length than the thickness of the pavement are set in place before the concrete is poured. After tamping and finishing of surface have been completed, the testing cylinders are substituted for the wooden ones, having the concrete tamped firmly around them, with their tops flush with the top of the pavement.

Installation of these cylinders in bituminous concrete and brick pavements can be effected with the use of the calyx core drill after completion of the pavement. Considerable care must be exercised when **grouting** around cylinders so that proper contact with adjacent pavement can be had.

The brass bearing plug (D) follows the downward movement of the pavement and the upward movement of the subgrade so that any separation



THE TESTING CYLINDERS USED IN ILLINOIS

between the subgrade and the bottom of the pavement due either to rutting caused by traffic or occasioned by moisture or frost conditions can be learned by measurements taken from this plug.

The device for reading the change in position of the bearing plug in relation to the pavement is shown at the right of the photograph. This device consists of an Ames dial fastened in a support (A) which rests on the stationary brass disc (D) and a rod (B) which fits into a small circular depression in the center of the bearing plug (F).

The difference between initial readings taken as soon as possible after testing cylinders are placed and readings taken at subsequent times shows any change in position between the subgrade and the pavement.

These bearing plugs also can be used to obtain data on bearing power of subgrade by loading them with the plunger of the static bearing power determinator.

By removing the brass bearing plug and iron sleeve, these cylinders afford an excellent means of obtaining subgrade samples for moisture content determination. Also the brass bearing plugs in the cylinders give excellent points for getting precise levels so that the amount of heaving or settling can be determined.

The testing cylinders are set in rows of three and five across the pavement, the rows being 25 ft. apart. When five cylinders are set in a row they are spaced in the center, at the quarter points, and 18 in. from the edges, and when three are used, the ones at the quarter points are omitted.

STEAM SHOVELS CLEAR OUT OLD WALLS

WITHOUT taking the trouble to wreck the old masonry walls preparatory to excavating the site of the new store and office building which is to occupy the entire block from Broadway to Eighth Avenue, and from 57th Street to 58th Street, New York City, George J. Atwell, the contractor, simply set a battery of steam shovels to work. The close-up shows the dipper of one of the shovels attacking a solid masonry wall. When the photograph was taken, it was biting out sections of an old wall with but little more apparent difficulty than when working in a clay bank. Loosening up the first few courses of brick or stone was the only slow part of the work. After that the shovel ate up the wall with no trouble at all.

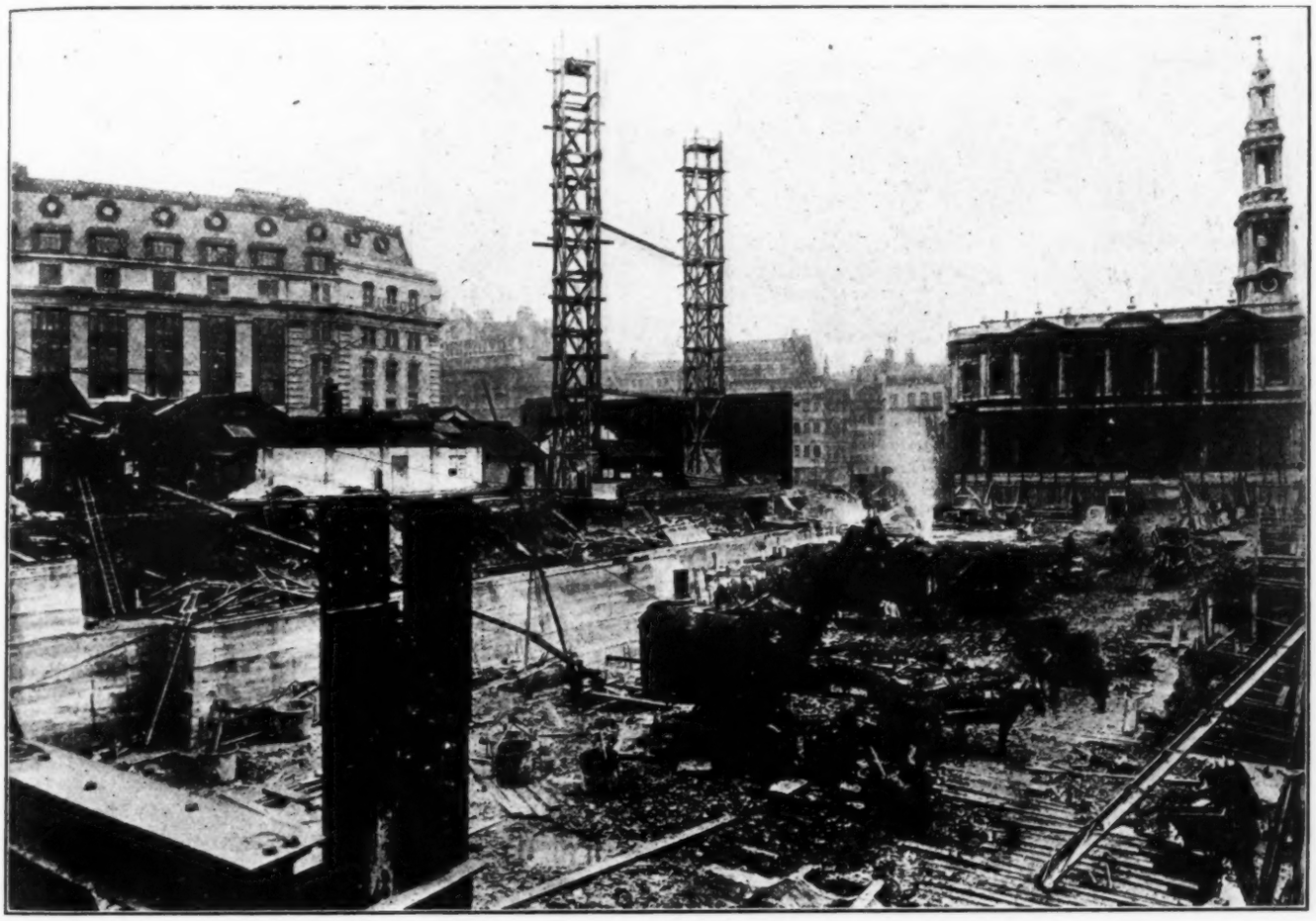
The general view of the job shows clearly the network of old walls that are being removed. The usual crowd of sidewalk superintendents helps to fill up the foreground.

Motor trucks were used to dispose of the excavated material and were assisted in climbing up the incline by a cable and hoisting engine.

The new building, which is to be known as the Columbus Circle Colonnade, will have only three of its proposed 23 stories built at the present time.

MAKING QUICK WORK OF OLD FOUNDATIONS IN NEW YORK CITY.

LONDON GETS A THRILL



Concrete Chuting Tower on New Bush Building Is Described as a "Source of Wonder"

AMERICAN construction methods are still a novelty in England, and the following paragraph from the London *Evening Standard* bears witness to this fact. It is headed "The Strand's New Attraction," and reads:

"People passing along the Strand have a new source of wonder in the steel 'concrete-chuting tower'—the first in London—now being erected for work at Bush House. Built of slender steel, with a flexible pipe, best likened to an elephant's trunk, hanging from the top, the new tower, it is claimed, will pour into the walls of Bush House between 60 to 120 tons of liquid concrete an hour.

"The concrete is mixed in an ordinary machine at the foot, and is then hoisted to the top of the tower, where it is automatically tipped into the line of piping, along which it runs to pour into framework of the wall or foundation under construction.

"The tower is 120 ft. high, but it can be raised even higher if necessary. Towers have been worked in the United States at over 200 ft., distributing the liquid concrete over a 600 ft. span of buildings. It is claimed that the saving in time and labor over the shovel-and-wheelbarrow method is enormous."

The average American contractor will confirm the claim made in the last sentence of the *Standard's* article.

The interest in the new building is confined not only to the methods of construction, but considerable discussion has taken place in regard to the proper articles to put in the leaden receptacle which is to be placed in the foundations, and no less an authority than H. G. Wells was consulted on the question. Here is what he had to say on the subject:

"Difficult to make suggestions. Probably commonplace things, with their current prices, will be of as much value as anything.

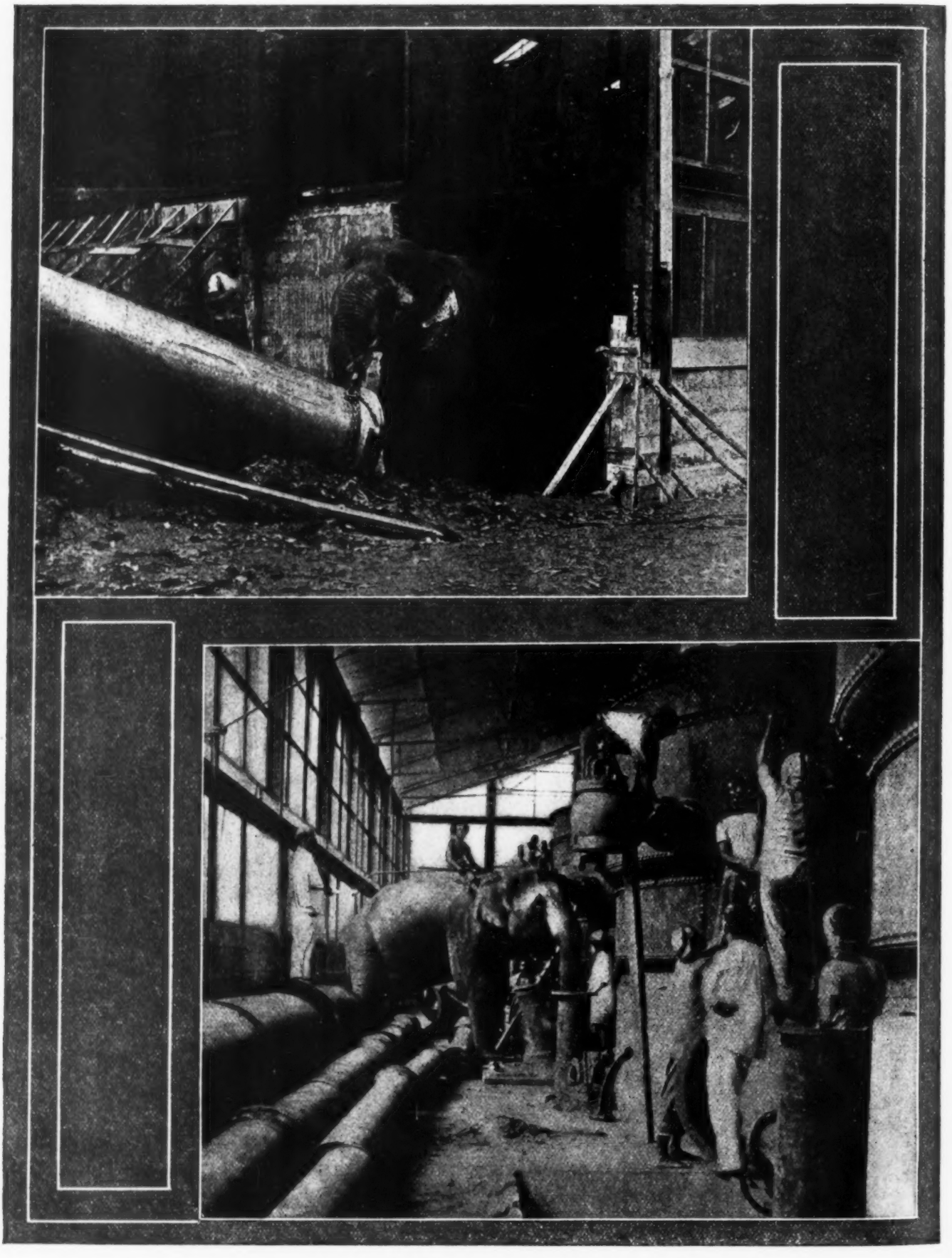
"Safety razor, cotton reel, bottle of pickles, and that sort of thing.

"Shoolbred's catalogue, pre-war, and post-war. Samples of patent medicines and what they profess to cure. Dietary of ordinary citizens; typewriter, a sewing machine and so forth.

"Dressing-bag with fittings. Current book on 'How to Behave.' A cinema reel of current events. 'Whitacker's Almanack' and Bradshaw's Continental Timetables (pre-war and post-war). Baedecker's England. Town maps and plans."

This receptacle is to be encased in the concrete some 60 ft. below the level of the street.

Material Handling In India



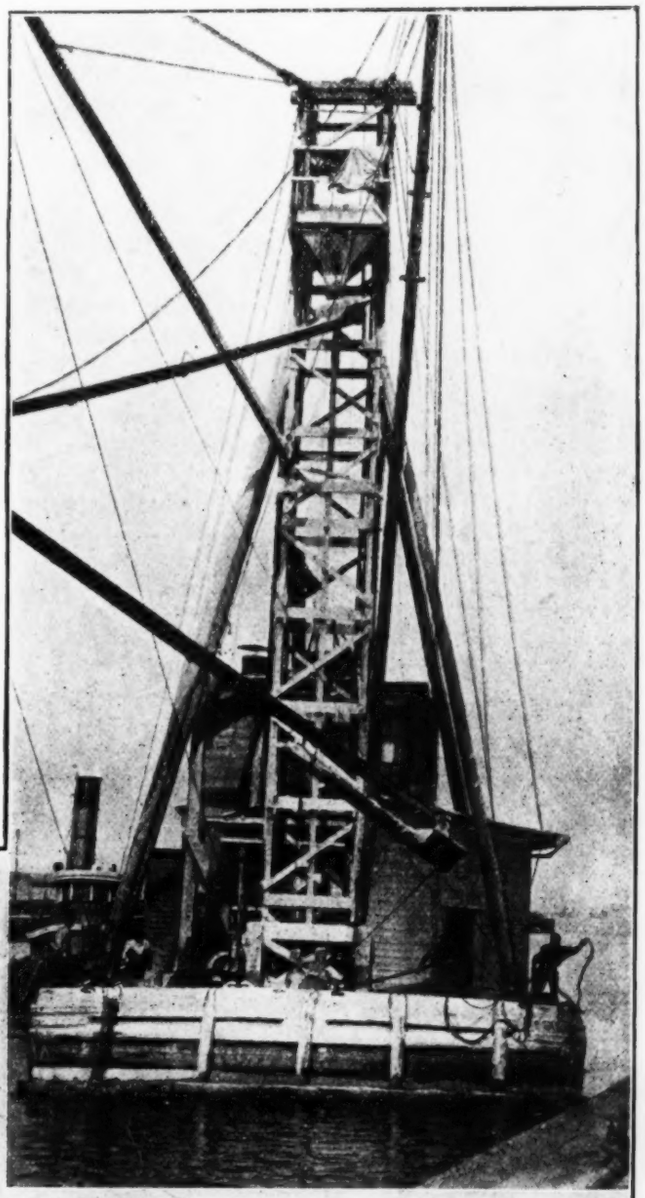
A MODERN FLOATING CONCRETE PLANT

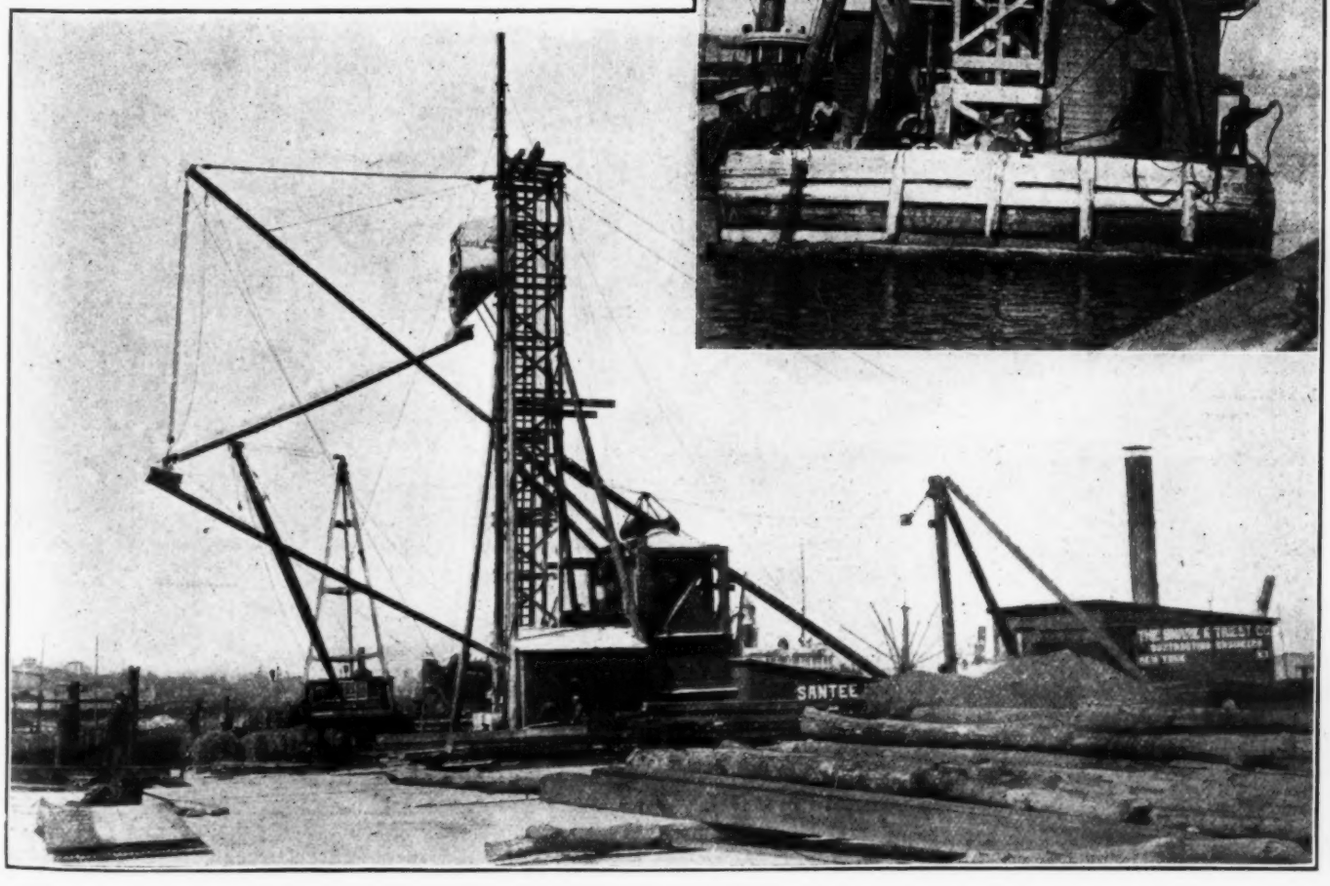
Demonstrates Its Usefulness in Waterside Construction

BY keeping constantly on the alert to meet ever-changing conditions, Snare and Triest have built a thoroughly up-to-date floating concrete plant. They are using it on their contract for two of the twelve new municipal piers which are now being constructed by the City of New York on Staten Island. The piers, which are 1110 ft. long by 130 ft. wide, consist of a concrete deck on wooden piles carrying a two-story steel superstructure. The second floor is heavy reinforced concrete.

The concreting plant consists of a 1-yd. mixer, a 36-yd. sand and gravel bin, a 70-ft. wooden tower with two sections of 40-ft. steel chutes, 75-ft. belt conveyor for handling cement, and a stiff leg derrick for charging the material hoppers, all mounted on a scow 37 ft. by 116 ft. The tower, which is high enough to take care of the second floor concreting, is used as a mast to which the two booms handling the steel chutes are rigged. One boom carries the upper and the other boom the lower section of the steel chutes.

When this plant is in operation, the scow is moored bow in to the job with a reach of 90 ft. and a capacity of a yard a minute. Stone and sand are received alongside in barges, and are unloaded by means of the derrick operating the clamshell. On the other side of the scow, cement is received and is unloaded on to a belt conveyor which delivers it to the cement shed immediately behind the charging hopper, or directly to the mixing platform itself, as desired.





PRISON WALL BUILT BY MODERN METHODS

Reinforcing Is Supported Independently of Forms on Job at New Illinois Penitentiary

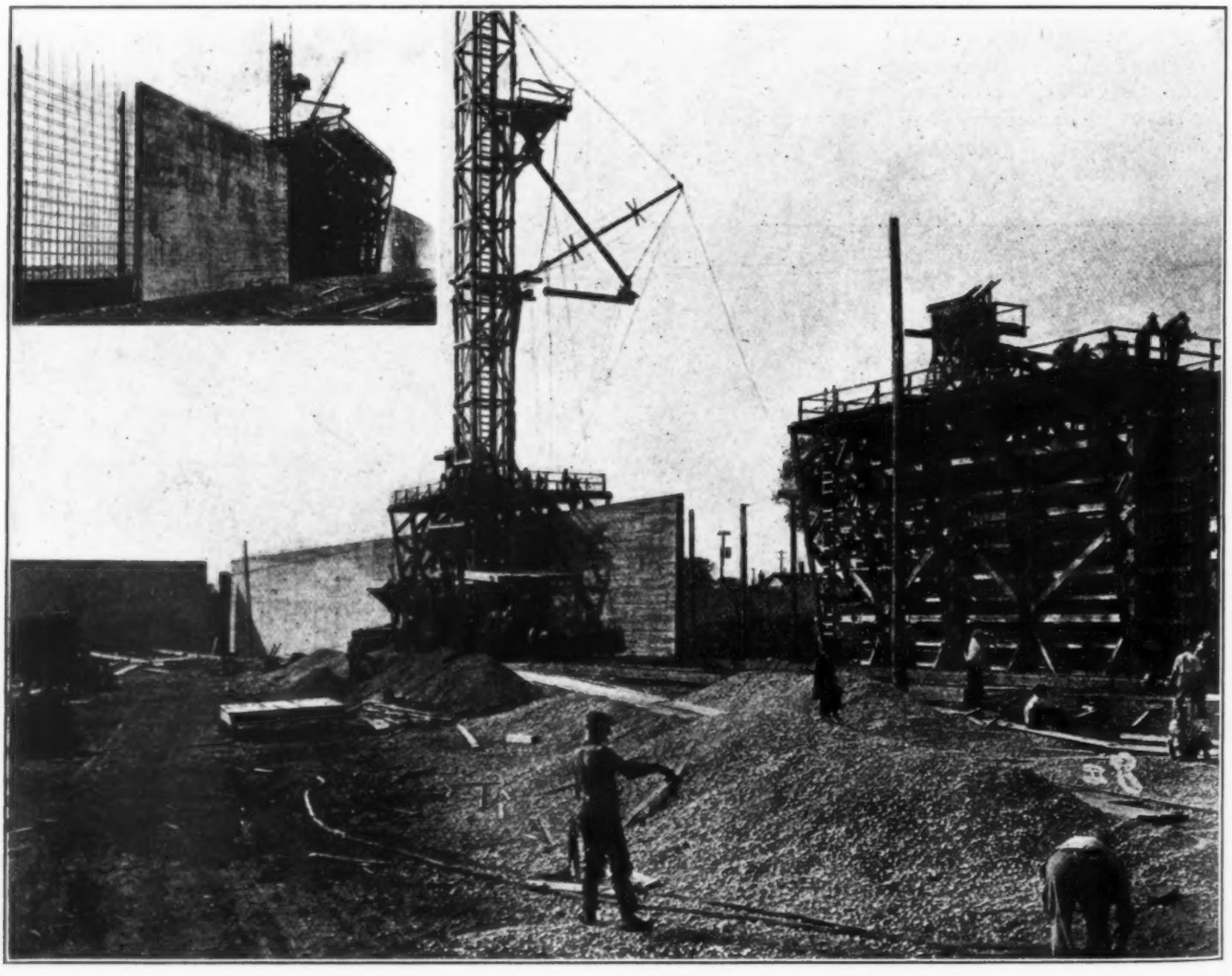
UNUSUAL and efficient methods, among them a means of supporting the reinforcing independently of the forms, were devised and are being used by Zimmerman, Saxe & Zimmerman, architects of Chicago, in building the wall which will surround the new Illinois State Penitentiary at Stateville, Illinois, near Lockport.

The wall, which is 1¼ miles long, will enclose 64 acres, and is free standing without buttresses or piers. It is 33 ft. high, 14 in. thick at the top, and 24 in. at the grade, and contains only about one-third as much concrete as any similar wall of its kind and corresponding height.

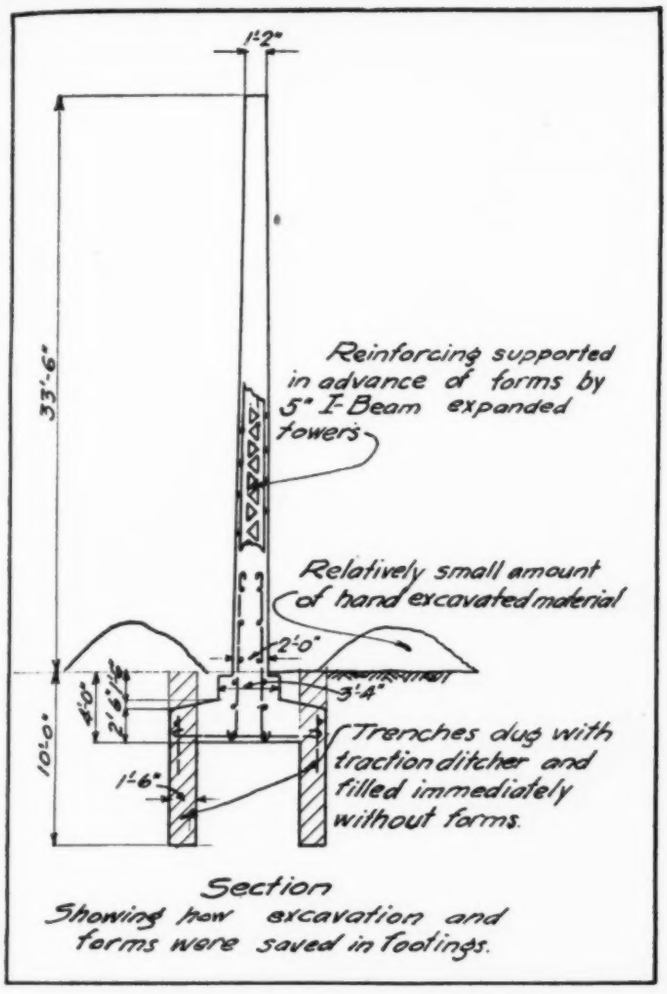
The wall footing is 9 ft. wide and it was necessary to carry it down a minimum of 10 ft. below grade to prevent convicts trying to escape from prison by burrowing or tunneling underneath. The sketch shows a section through the footing. A trenching machine excavated the portions shown cross hatched and the concrete was placed immediately, before the banks had a chance to cave. This effected a great saving both in time required and in excavating, and requires no refilling of excavated material. A reinforced slab was then thrown across from wall to wall. Before this slab had set 5 in. I-beams, expanded as shown in the photograph, were set vertically and the horizontal reinforcing attached to them. This does away with the necessity of hanging the reinforcing on the forms, making it possible to use one 50-ft. section of form for the entire job. All the reinforcing is placed in advance and the form moves along on a track. The method of procedure and the shape of the foundation has been patented.

The mixing plant travels with the forms. The concrete is elevated into a hopper equipped with a five way spout which permits the even distribution over the full section. Alternate sections are poured, one section being a day's work, although it can be poured in less than four hours.

Prison labor is used almost exclusively on the construction of the wall as well as on the numerous buildings which it will enclose.



A GENERAL VIEW OF THE CONSTRUCTION PLANT, SHOWING A SECTION OF THE FINISHED WALL. IN THE INSERT THE INDEPENDENTLY SUPPORTED REINFORCING MAY BE SEEN AT THE LEFT.

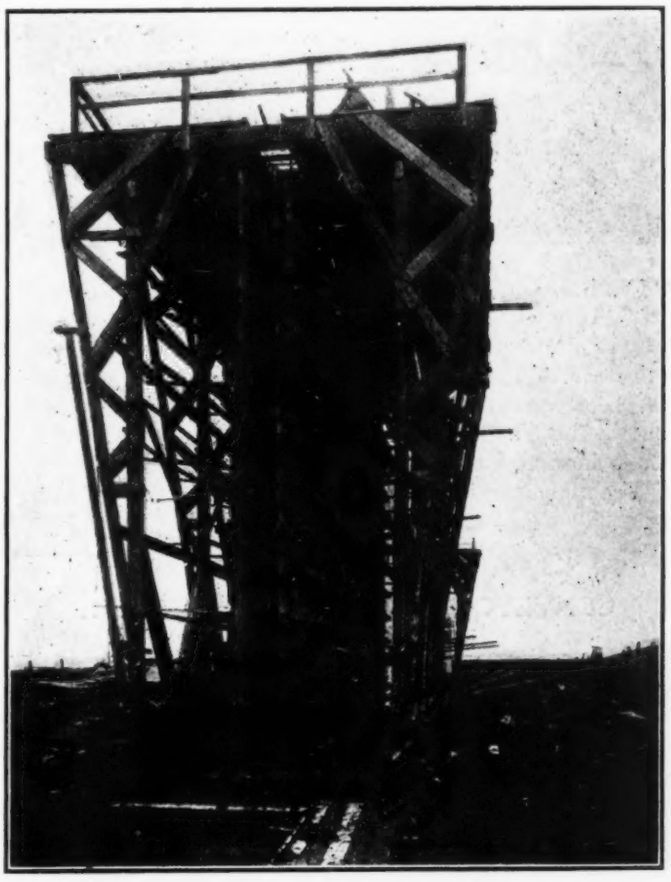


THE NOVEL FOOTING CONSTRUCTION

A study of the above section of the wall and foundation will serve to emphasize the fact that designs and methods of ordinary construction have by no means become standardized. The problem of the foundation apparently presents nothing new—nothing but a straightaway footing proposition. However, the architects analyzed this problem from all points of view with the result that instead of a trench 9 feet or more in width together with a heavy concrete footing, the section above shown was devised. The point is that the cost of many an apparently simple construction job may be lessened by the use of machines to do work which they are not ordinarily supposed to be fitted for.

The forms, an end view of which is shown on this page, are mounted on a track. Here again original ideas were applied to what would generally be looked upon as a standard method of form construction.

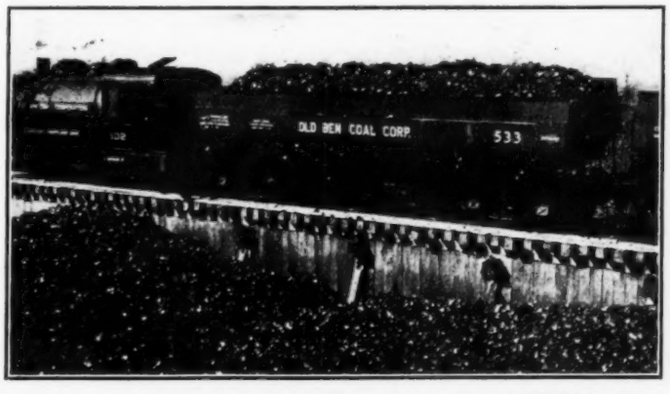
The wall section is new in design. It has received much publicity and favorable comment from those interested in that type of construction.



AN END VIEW OF THE TRAVELING FORM

BIG DUMP CARS HANDLE COAL

THE extent to which the contractor's little old dump car has been developed is shown in the illustration of the new 45-yd. 100,000 capacity air dump and lock cars which are being used by the Old Ben Corporation at Sesser and Johnston City, Illinois. The car shuttles between the tipple and the dump, a few thousand feet away, where the coal is stored until it is loaded into system cars.

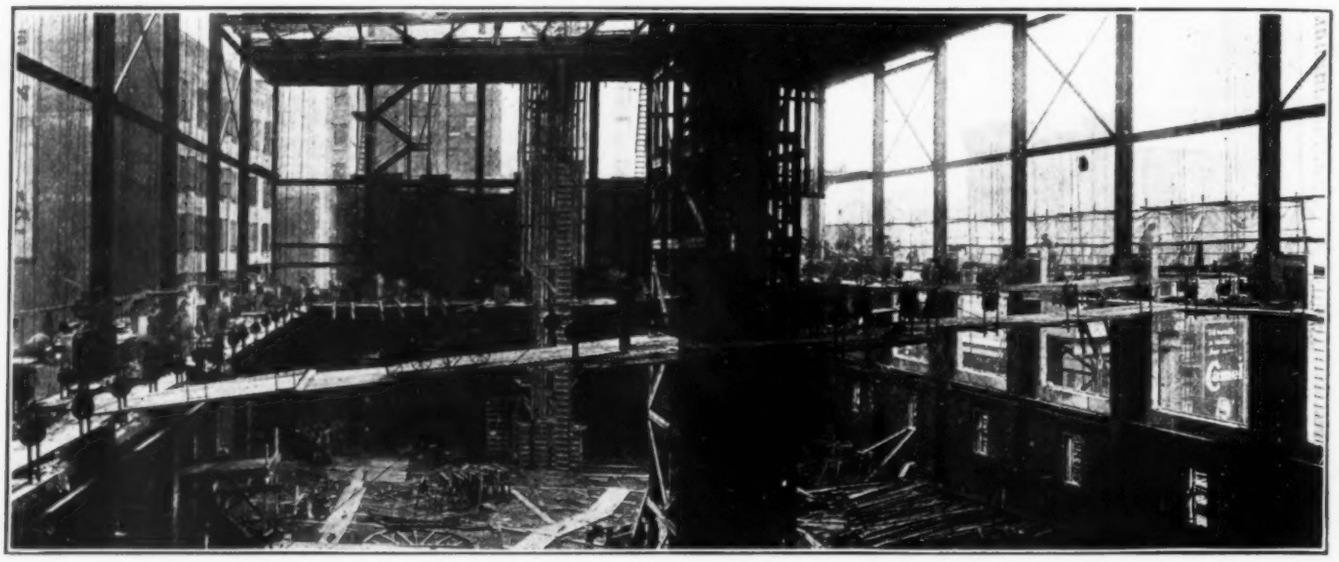


THE LARGER TYPE OF DUMP CAR, IN ADDITION TO BEING USEFUL IN INDUSTRIAL SERVICE, MAY EASILY HELP OUT AND PROVE VALUABLE IN CAR SHORTAGE EMERGENCIES

The dumping and locking mechanism of the cars may be worked from the engine cab, and the machines may be dumped either singly or simultaneously as desired.

The Old Ben Corporation is now using both small and large cars in its mining operations, and the big cars are making good on the part of the work to which they have been assigned. They prove their worth.

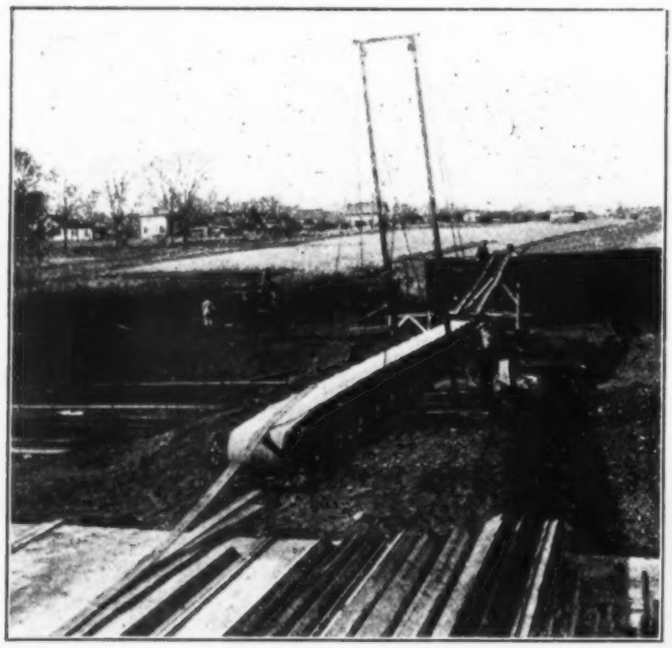
Wide Scaffolds Make Material Handling Easy



THE healthiest business men in the world, the New York curb operators, have succumbed to the call of the permanent home. After a long career in the open air in Broad Street, the New York Curb Market is preparing to move indoors. The photograph below shows the Thompson-Starrett Co. at work on the new Curb Market building in Trinity Place.

Prominent in the photograph is shown the interior wide suspended scaffold and runway system which is being used with success. The scaffolds and runways, which are suspended by wire rope, are raised and lowered by means of worm gear windlasses operated on the platforms. The advantages of the wide scaffolds, which are 8 ft. in width, are that the wheeling of material is permitted and materials may be delivered directly to the bricklayers without rehandling.

CONVEYOR HANDLES STRAP STEEL



THE ease with which a conveyor handled strap steel is shown in the accompanying photograph. It was necessary to transfer the strap steel from the car to a platform some distance away, and the conveyor bridged the gap successfully. Two men unloaded the car and started the steel on its way. Another man shifted the conveyor from time to time so that the steel would not always be piled in one place. It was unusual material for a belt conveyor but no difficulty was experienced in handling it and the machine was not injured.

BRIDGE BUILDING UNDER COVER

THE photograph shows a concrete bridge that was built under a shed during the month of January at Sheridan, Wyoming, on the Goose Creek road. The bridge was part of a Federal Aid Project under supervision of the Wyoming State Highway Commission. The contractor was F. H. Fraser, and in order to prevent damage to the concrete from freezing a shed was built over the work and stoves used inside.

Western

The WESTERN DITCHER

Simple, Practical, Efficient

Here is a Tool especially designed for cutting and cleaning lateral irrigation ditches, to a depth of 2½ feet and a top width of 5 feet. *It avoids the defects of the crude ditchers on the market.*

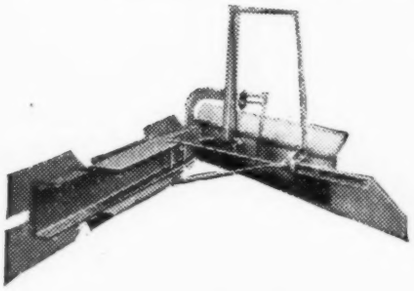
Like all Western equipment, the Western Ditcher is superbly built to meet the practical demands of experience

You have been looking for this

Instead of a long, rough landside that will not scour, the landside of the WESTERN DITCHER is fitted with fins at both front and rear ends, made of plow steel. They carry all the side-draft and scour perfectly.

Instead of a blade which chokes the operation by picking up and carrying along every obstruction, the blade of the WESTERN DITCHER has a sharpened end, which picks up no grass or rubbish.

Instead of a fixed, perpendicular blade, whose efficiency decreases constantly as the ditch deepens, the blade of a WESTERN DITCHER has the correct curvature for earth cutting and both edges are fitted with detachable shares, easily removable for sharpening. The top of the blade can be tipped backward or forward to conform to the wear of the shoe and the increasing depth of the ditch. The WESTERN DITCHER has these and other improvements which experience has shown to be desirable.



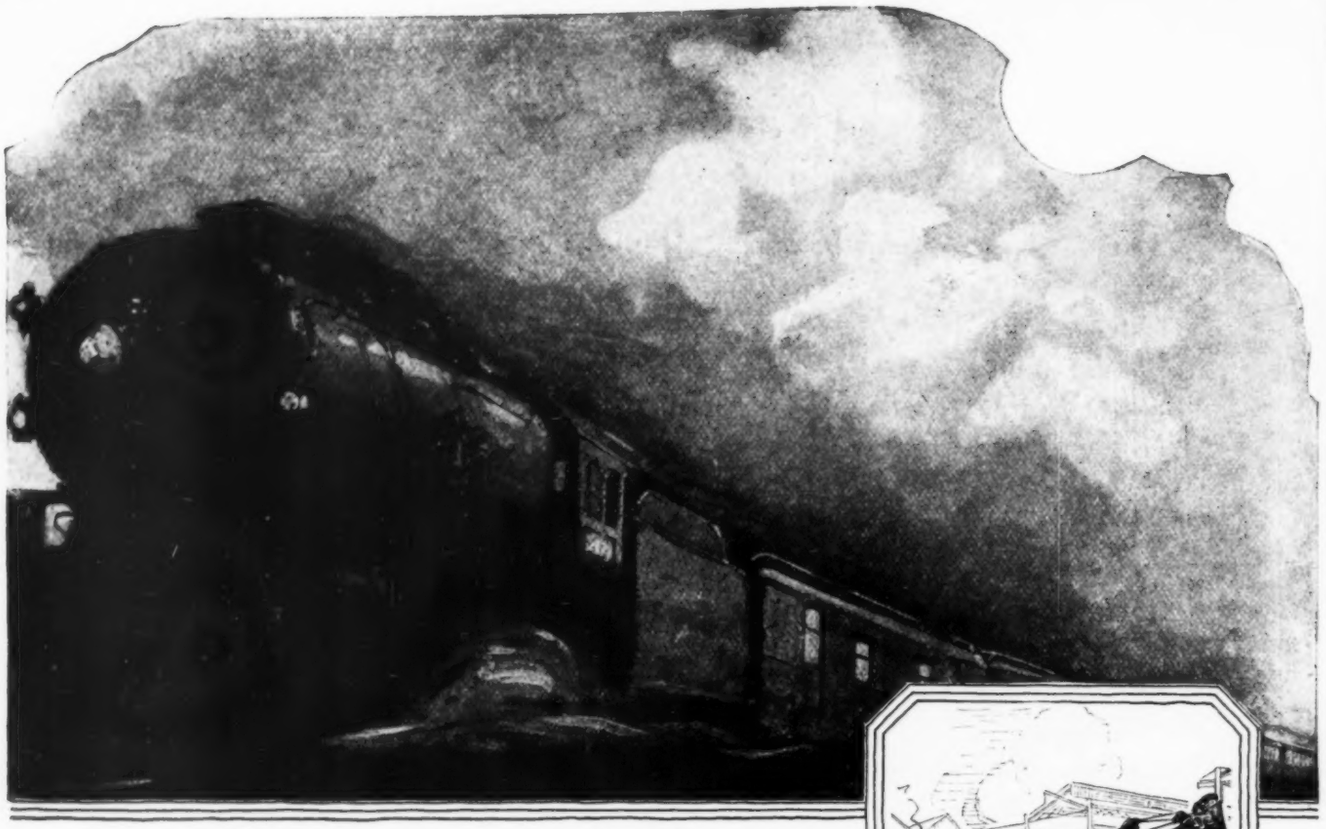
Send for our Catalog SM-51, showing the Western Line of Contractors Equipment.

Western Wheeled Scraper Co.

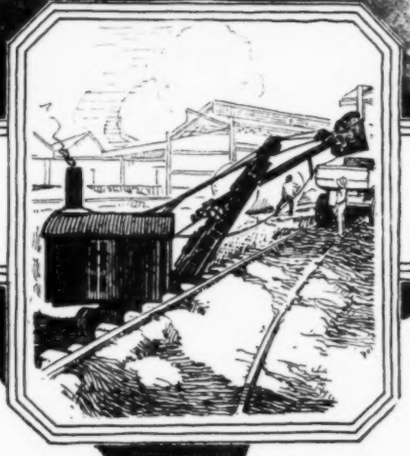
Earth and Stone Handling Equipment

Aurora, Illinois, U. S. A.

Founded 1877



Speed



SPEED in a shovel can not be measured by the results of a few hours work under favorable conditions. It is the power to work consistently that counts on the job. Quick response to control coupled with ample reserve energy is necessary.

Thew shovels have the refinement of design, the pride of workmanship and the careful selection of materials which combine to make them consistent, constant producers with a uniform speed under all conditions.

There is a Thew that is built for your work.

THE THEW SHOVEL COMPANY
LORAIN, OHIO

Thew
Power Shovels

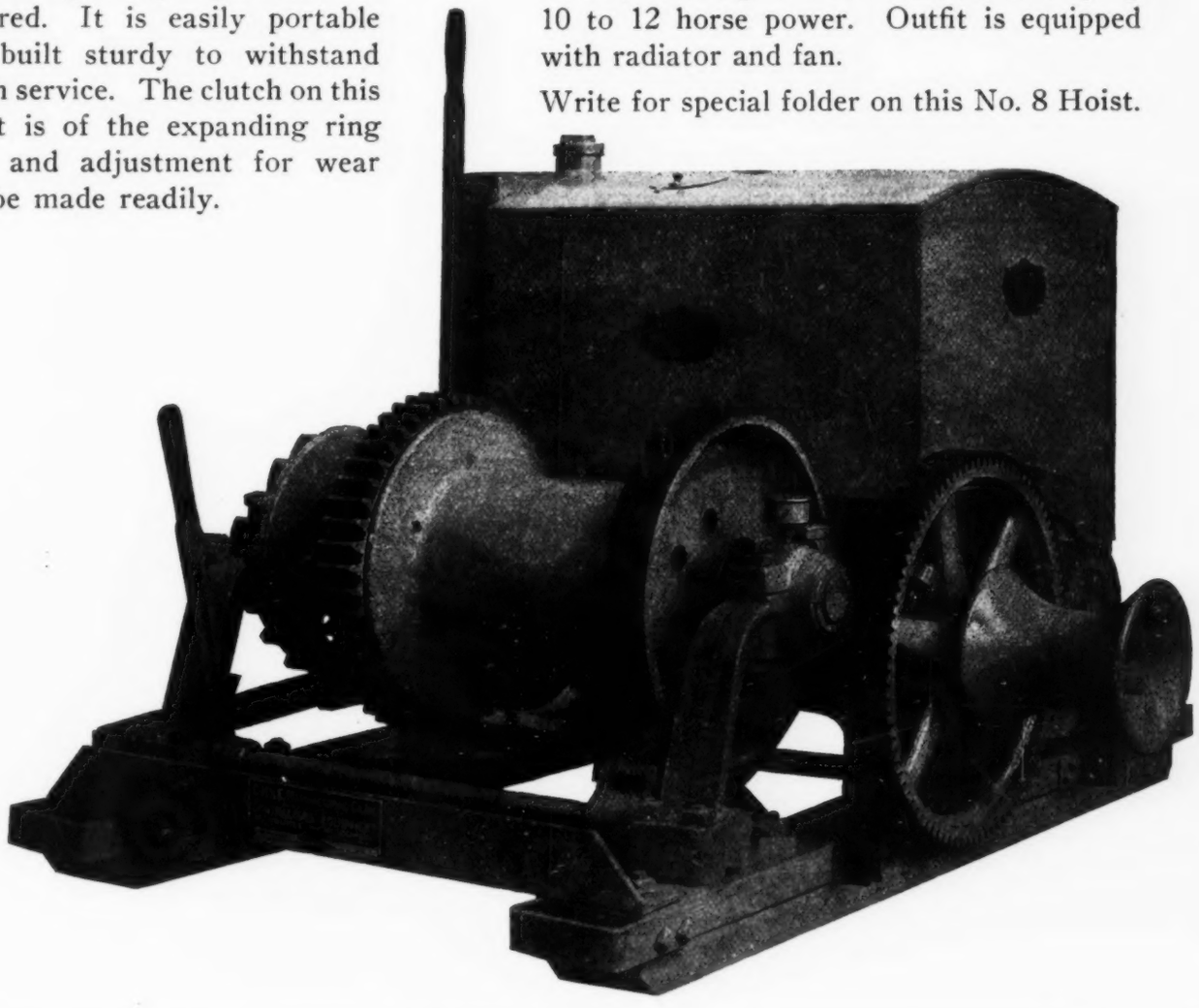
C H & E

Single Drum Hoist with 4 Cylinder Gasoline Engine

This single drum Hoist was developed especially for service where a light high speed hoist is required. It is easily portable and built sturdy to withstand rough service. The clutch on this Hoist is of the expanding ring type and adjustment for wear can be made readily.

The four cylinder gasoline engine—mounted in this outfit—is a heavy duty type of truck motor, running at 700 R.P.M., developing 10 to 12 horse power. Outfit is equipped with radiator and fan.

Write for special folder on this No. 8 Hoist.



MANUFACTURED BY

C. H. & E. Manufacturing Co., Inc.

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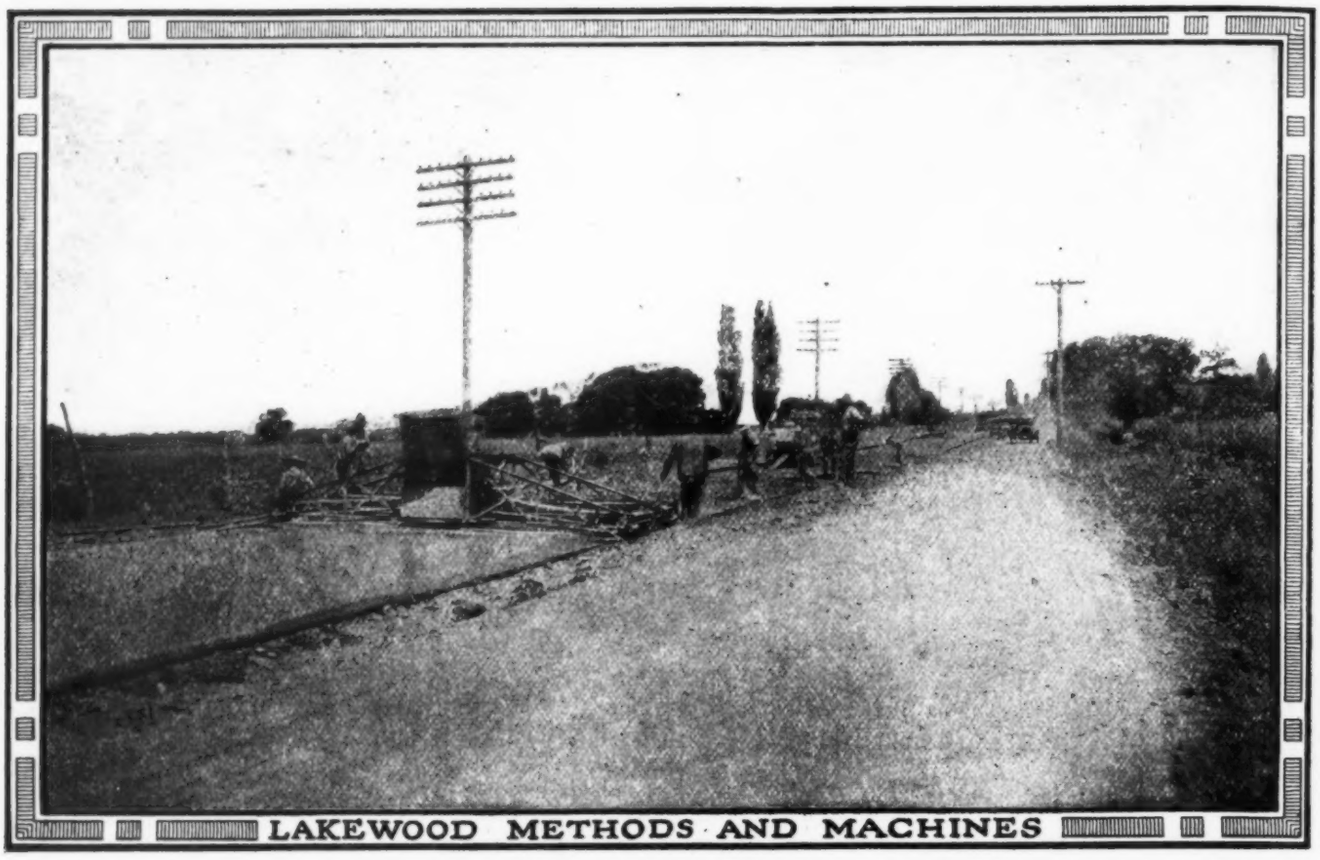
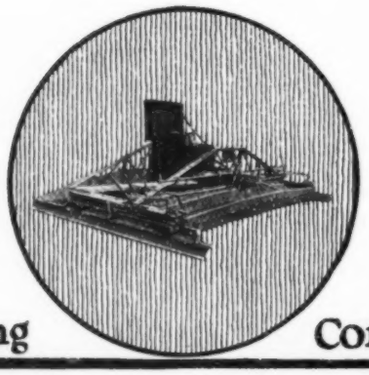


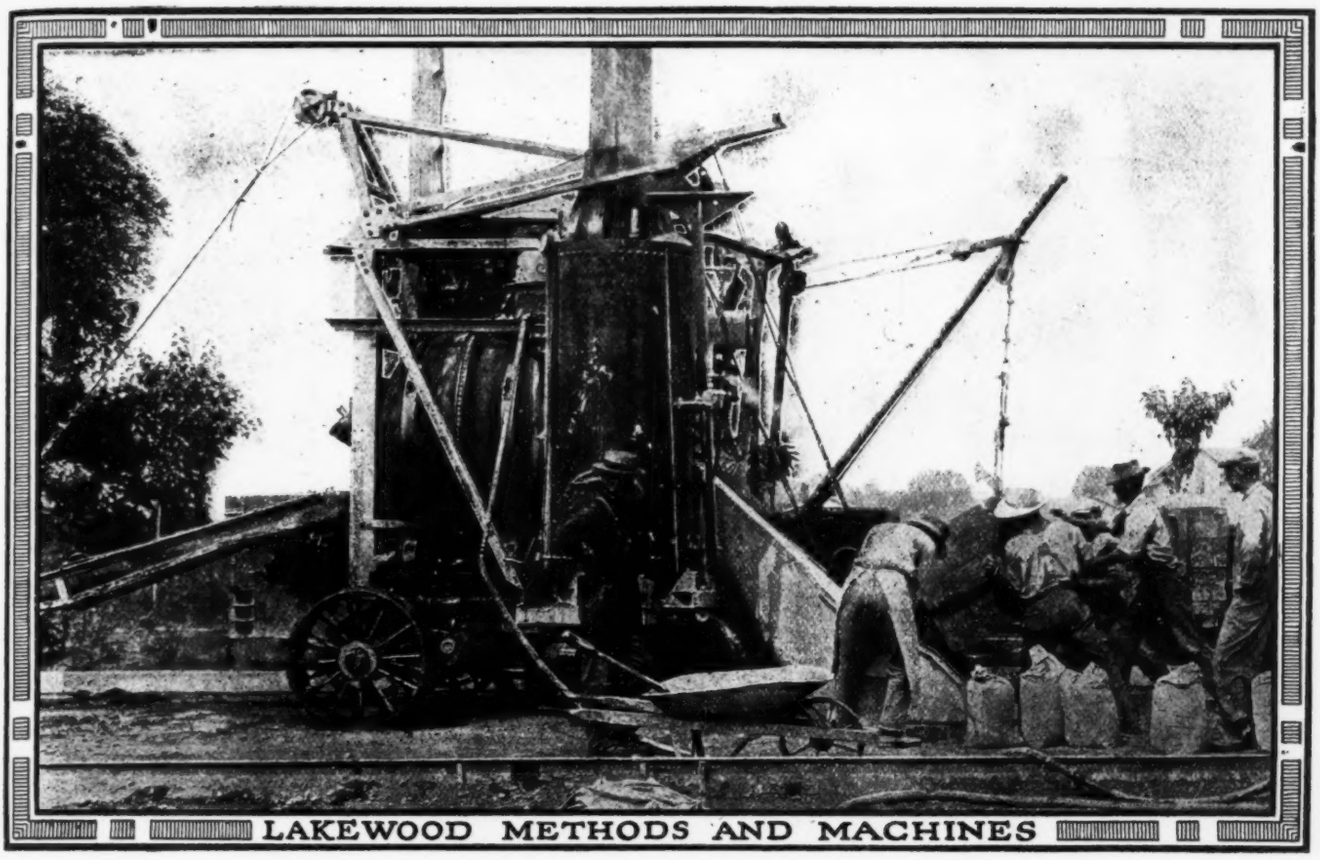
A Smooth, Even Surface and Better Concrete Roads

Smoother, easier-riding roads—roads that *last* longer —result when the Lakewood Finisher is used. The concrete is compacted—the voids are removed. And a true, even surface is secured.

Wherever concrete roads are built you'll find the Lakewood Finisher. Nearly 500 in successful use last year. May we send you complete information?



The Lakewood Engineering Company, Cleveland U.S.A.

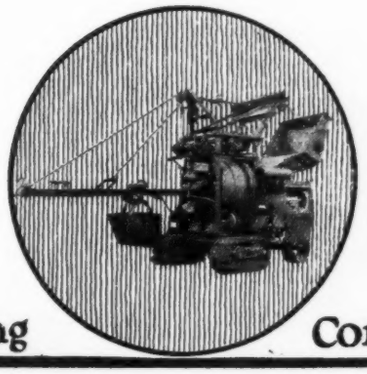


Since 1918 Currie Has Used This Lakewood Paver

Thomas E. Currie was the first contractor in Detroit to use Lakewood plant to build roads the Lakewood way. Since 1918 this Lakewood-Milwaukee Paver, with the Lakewood batch transfer, has helped Currie cut road building costs.

Lakewood road plant is well liked in Detroit. Last year 12 Lakewood pavers were used there in connection with the direct charging system.

Ask for the Lakewood Road Plant Bulletin



The Lakewood Engineering Company, Cleveland U.S.A.

Why is This a Better Dump Car?

Because:—

1. It is equipped with Hyatt Roller Bearings.

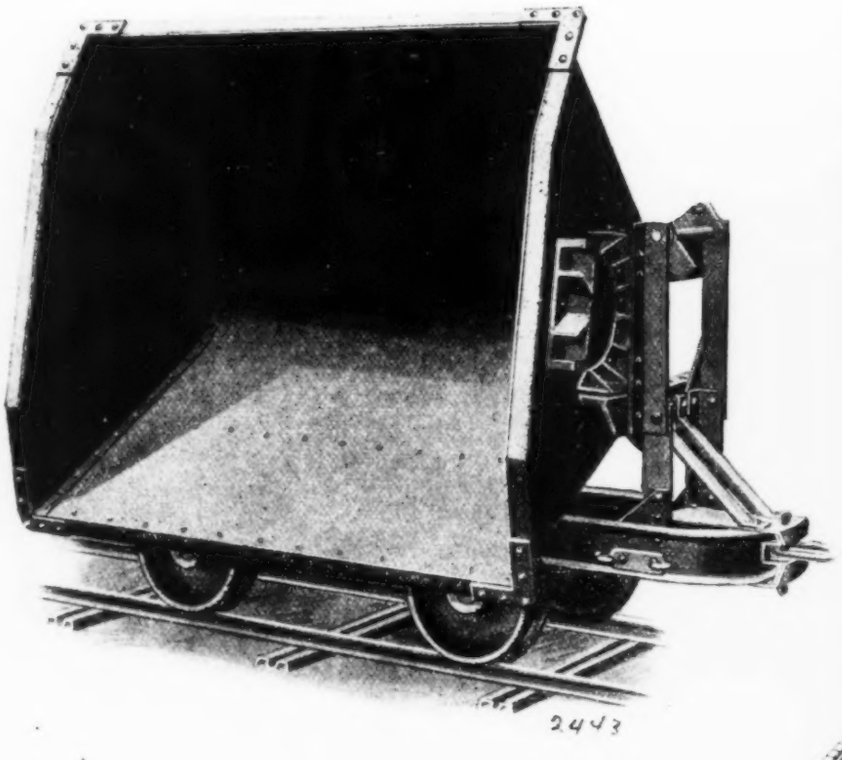
2. It is manufactured by the Lakewood Engineering Company.

3. The bearings will give satisfactory, easy running service for years under a maximum of use and abuse and require a minimum of attention for lubrication and maintenance.

4. Because the rest of the car is just as carefully built as the bearings and designed to stand the wear and tear without deterioration.

Specify that your cars be Hyatt equipped—the additional cost is small, the service great.

HYATT ROLLER BEARING COMPANY
NEW YORK, N. Y.



Hyatt Equipped Side Dump Car, Manufactured by Lakewood Engineering Company, Cleveland, Ohio.